ELGIN STORAGE
TN
122
S7A3
no. 11
Physical & Applied Sci. Serial
Engineering

South Australia.

A REVIEW

OF

MINING OPERATIONS

IN THE

STATE OF SOUTH AUSTRALIA

DURING THE

HALF-YEAR ENDED DECEMBER 31st, 1909.

LIBRARY
JAN 9 1969
UNIVERSITY OF TORONTO

No. 11.

DO NOT REMOVE
FROM THIS ROOM

ISSUED BY T. DUFFIELD, J.P., *Secretary for Mines,*

UNDER THE AUTHORITY OF THE

HONORABLE A. H. PEAKE, M.P.,

Minister of Mines.

DEPARTMENT OF GEOLOGICAL SCIENCES
UNIVERSITY OF TORONTO

Adelaide:
R. E. E. ROGERS, ACTING GOVERNMENT PRINTER, NORTH TERRACE.

1910.

ENGINE STORAGE

South Australia.

A REVIEW

OF

MINING OPERATIONS

IN THE

STATE OF SOUTH AUSTRALIA

DURING THE

HALF-YEAR ENDED DECEMBER 31st, 1909.

No. 11.

ISSUED BY T. DUFFIELD, J.P., *Secretary for Mines*,

UNDER THE AUTHORITY OF THE

HONORABLE A. H. PEAKE, M.P.,

Minister of Mines.

Adelaide:

R. E. E. ROGERS, ACTING GOVERNMENT PRINTER, NORTH TERRACE.

1910.

MINERS' RIGHTS AND PRIVILEGES THEREUNDER.

A miner's right is obtainable at the Department of Mines, Adelaide, also at the issuing stations in the various mining districts, at a cost of 5s.

A miner's right is in force for one year from the date of issue, and may be renewed at any time during its currency for another term of one year on payment of 5s.

The holder of a miner's right is authorised to prospect on any mineral lands for any metal, mineral, coal, or oil, and to peg out (of the prescribed shape and dimensions) gold, mineral, coal, and oil claims, and also leases of a like nature.

AREAS AND WORKING CONDITIONS.

GOLD LEASES—Maximum area, 20 acres; working conditions, one man to every five acres.

MINERAL LEASES—40 acres; one man to every 10 acres.

MISCELLANEOUS LEASES—

Salt	640 acres;	special conditions.
Gypsum	640 "	one man to every 40 acres.
Mining Works	10 "	one man.
COAL OR OIL LEASES	640 "	one man to every 40 acres.
GOLD DREDGING LEASES	200 "	special conditions.
MINERAL CLAIMS	40 "	
GOLD CLAIMS	30ft. x 30ft., alluvial;	100ft. x 600ft., reef.

Gold claims must be constantly worked—one man for each claim—and mineral claimholders must employ two men for each claim. Amalgamation of either gold or mineral claims reduces the labor conditions by one-half.

Gold, mineral, coal, and oil leases are granted for a term of 42 years—the two former at a rental of 1s. per acre per annum and a royalty of 6d. in the pound on net profits, the latter at a rental of 6d. per acre per annum until coal or oil is found in payable quantities, when 1s. per acre is payable and a royalty of 6d. in the pound on the net profits.

The Minister may permit, for the concentration of labor, of the amalgamation of not more than four adjoining gold or mineral leases.

Any number of gold, mineral, coal, or oil leases may be held by one person.

Licences to search for twelve months for precious stones, mineral phosphates, oil, rare metals, minerals, and earths are issued on specific mineral lands, not exceeding five square miles in area for one person, a fee of 20s. being charged for each square mile or portion thereof. These licences give a preferential right to a lease over a portion of the area, as prescribed.

PREFACE.

The average price of standard copper for the half-year has been £59, the lowest since 1903. The total value of the output of copper for the year slightly exceeded that for 1908, a result somewhat unexpected in view of low prices and the restriction of operations in the latter portion of the year owing to the recent coal strike in New South Wales.

The output of salt is smaller for the past year owing to the exceptionally wet and prolonged winter. This will result in an increased deposit for the ensuing season.

The strike at Broken Hill brought the ironstone and limestone flux industries to a standstill for a lengthy period.

With a settlement of these disputes and a rising market for copper the present outlook for the mining industry is much more encouraging than it was at the beginning of 1909.

The repeal of the Mining on Private Property Act, 1888, and the passing of a new Act in 1909 will, it is hoped, largely increase the scope of mining operations in the settled districts.

T. DUFFIELD, *Secretary for Mines.*

February 28th, 1910.

INDEX.

	PAGE.
Accidents on Mines	13
Ajax Mine	17
Arltunga Battery Returns	12
Assays at School of Mines	15
Battery Returns	10–12
Boring Operations at Kadina and Copper Hill	9
Carnotite	25
Corundum	8
Coal, Anson Bay, N.T.	7
Commodore Mine	21
Commonwealth Mine	6, 17
Copper—Average Prices, &c.	10
Ding Dong Mine	22
Dredging Operations	7, 25
Ediacara Mine	6
Flint Deposits, South-East	8
Flinders Mine	19
General Notes	6–8
Glenloth	6–11
Glamorgan Mine	19
Gold Dredging	7
Graphite	23
Hooper & Boxer's Mine	21
Homeward Bound	21
Iron Mount Mine	19
Ironclad Mine	18
Kapunda Mine	6
Kirkeek's Treasure Mine	18
Kingscote Bore	7
Limestone Flux	24
Metals Exported, Return of	13
Mining Operations for Half-year	5
Mutooroo Mine	7
Nectar Mine	21
New Milo Mine	20
No Gammon Mine	21
Ochre, Oodla Wirra	24
Paringa Mine	19–23
Poona Mine	23
Producer Gas Engines	26
Radium Hill	25
Rapid Bay	18
Returns—Cyanide Plants	10–12
Mineral Output	16
Metals Exported	13
Reports—Addenda to Record of Mines	17
Salt	7
Saltwater, Kingscote Bore	7
Scotchman Mine	18
Subsidies granted	14–15
Tarcoola and Glenloth	6
Tanami Goldfield	26
Tumby Bay Mine	23
Virtue Mine	17
Walparuta Mine	25
Wallaroo Mine	6
Wheal Bessie Mine	23
Wheal Ellen Mine	6, 17
Wheal Sarah Mine	8
Yattagolinga Mine	18
Yelta Mine	24

MINING OPERATIONS DURING THE HALF-YEAR ENDED DECEMBER 31ST, 1909.

AREA AT PRESENT HELD UNDER MINING ACTS (DEC. 31ST, 1909).

Nature of Holding.	Number.	Area.
Mineral leases	303	15,542 acres
Gold leases	84	1,546 "
Gold dredging leases	6	721 "
Miscellaneous leases	42	7,404 "
Mineral claims	393	13,238 "
Occupation licences	219	108 "
Search licences	38	39,680 "
Coal and oil claims	11	5,947 "
Gold claims	78	107 "
Total holdings	1,174	84,293 acres

REGISTERED FROM JULY 1ST, 1909, TO DECEMBER 31ST, 1909.

Mineral claims	84	2,509 acres
Gold leases	4	70 "
Mineral leases	4	133 "
Miscellaneous leases	2	210 "
Miners' rights	483	—
Search licences	11	12,160 "
Coal and oil claims	7	4,480 "
Gold claims	71	98 "
Total	666	19,660 acres

MEN EMPLOYED.

Number of men employed in mining and mineral works, December 31st, 1909—

Copper	4,450
Gold	920
Salt	470
Silver-lead	40
Other minerals	570
Total	6,450

NORTHERN TERRITORY.—OUTPUT AND VALUE OF METALS AND MINERALS FOR THE YEAR ENDING DECEMBER 31ST, 1909.

Metal or Mineral.	Quantity.	Value.
		£
Gold	7,953 ozs.	24,148
Copper ore	115 tons	1,400
Copper matte	62 "	1,612
Copper blister	17 "	730
Wolfram ore	42 "	4,105
Tin ore	427 "	32,741
Total value for year 1909	—	£64,736

GENERAL NOTES.

COPPER OUTPUT.

The average price of standard copper during 1909 was £58 17s. 2d., this being the lowest since 1903, and £7 8s. 9d. per ton lower than the average for the past ten years. Under these circumstances it is pleasing to note that the value of copper output for 1909 amounts to £338,587, being slightly in excess of the previous year, when the average was £60. This would have been largely exceeded had not production been restricted during the latter portion of the year owing to the coal strike in New South Wales, whereby reduced operations were enforced at the chief mining centres.

WALLAROO MINES.—The Wallaroo and Moonta Mining and Smelting Company report the production of 2,620 tons of copper, as against 2,858 tons for the first half of the year, this being an average of 4·79 per ton of ore treated from the Wallaroo Mines, and 4·27 from the Moonta ore, including precipitates. At the Paramatta Mine a party of tributers obtained 252 tons for treatment, the yield being 29 tons of metal, valued at £1,087. This company (The Paramatta Copper Mines, Limited) is now in liquidation.

EDIACARA.—This mine has been let on tribute, and operations during past six months have been principally confined to stoping. The last return shows 100 tons of ore have been treated, the total value being—silver, £146 6s.; lead, £90 1s. 9d.; and copper, £22 6s. 8d.

TARCOOLA AND GLENLOTH.—The Tarcoola Blocks Company treated 745 tons for 1,944ozs. of gold, valued at about £4,375, thus maintaining the high average for which this mine has been noted in the past. To the end of 1909 the total output of this mine was valued at £120,954, this being obtained from 27,778 tons of ore treated, the yield being 39,555ozs. of gold, or £4 7s. per ton. At Glenloth the treatment of 359 tons gave a result of 487ozs. of gold, valued at £1,689, or £4 14s. per ton.

WHEAL ELLEN MINE.—The principal developmental work during past half-year has been stoping the body of iron pyrites at the 150ft. level, and the 240ft. level has been drained and opened up ready for stoping the body of pyrites at that level. Five hundred and eighty-three tons have been obtained, valued at £875. One hundred and ninety-four tons of auriferous gossan treated returned gold valued at £126 13s. 1d. A deposit of native sulphur has been discovered in this pyrites lode, the assays for large parcels being over 50 per cent.

KAPUNDA MINE.—A party of tributers recently raised and treated a parcel of 22 tons from this formerly prominent mine. The average produce was 20 per cent., and yielded 4 tons 7cwts. 2qrs. of copper, valued at £246 8s. 7d. It is now proposed to sink a shaft to prove a lode of copper which was disclosed by the percussion bore in 1907 at a depth of 244ft.

Mutooroo.—This old established mine has only been intermittently worked by a party of five tributers, who treated about 25 tons of ore, which returned £280. The company has also been experimenting in the direction of precipitating the mine water; 6¾ tons of precipitates, valued at £196, were obtained from this source.

GOLD DREDGING.

Gold dredging operations have only been carried on in two localities during past six months. The Onkaparinga Dredging and Mining Co. have treated about 27,000 square yards, for a yield of 80ozs. 4dwts. of gold, valued at £304 17s. 2d. They are now approaching the richer ground, and better results can be confidently looked for.

The Long Gully Hydraulic Sluicing Co. treated 4,000yds. during the past half-year, the gold won being but 20ozs. 14dwts. The total won is 344ozs. 11dwts., valued at £1,332. The company has now gone into liquidation.

SALT.

The returns for past half-year report that, as is usually the case for that period, the lakes have generally been too wet to allow of scraping operations, and it is anticipated that the unusually wet season will result in a much increased yield for the next half-year. The returns show only 1,407 tons as being obtained, as against 50,000 for the first half of year.

A bore recently put down near Kingscote, on Kangaroo Island, revealed brine which may be in the future profitably used by evaporation. The proportion of salt per gallon is so unusually large that the analysis of this water as compared with sea water will prove of interest. This water was struck at 1,048ft. and rose to 37ft. from surface.

Analysis of Water from Kingscote Bore.

	Grains per Gallon.
Calcium carbonate	3·2
" sulphate	114·2
Magnesium chloride	503·1
Sodium chloride (common salt)	3,147·1
Calcium chloride	601·3
Potassium chloride	61·1

Grains, 4,430·0 = 10·12ozs. per gallon.

Analysis of Sea Water.

	Grains per Gallon.
Calcium carbonate	2·3
" sulphate	98·4
Magnesium chloride	256·6
Sodium chloride	1,894·1
Magnesium sulphate (Epsom salts)	160·7
Potassium chloride	51·6
Magnesium bromide	2·0

Grains per gallon, 2,465·7 = 5·63ozs. per gallon.

BORING FOR COAL AT ANSON BAY, NORTHERN TERRITORY.

Samples of the cores from the depth of 339ft. to 1,229ft. in the last bore at Anson Bay have been received and examined. The sinking has been through alternations of sandstone and shales, with occasional leaf impressions and laminations of coaly

matter. At 640ft. leaf impressions of plants of similar genera to those found in the New South Wales permo-carboniferous coal measures have been identified, and at 395ft. and 947ft. respectively 3in. of coal and coal shales were passed through, analyses of which are as follows:—

From 397ft.

	Per Cent.
Moisture at 100° C.	6·40
Volatile matters	29·00
Fixed carbon (non-caking)	45·23
Ash	19·37
	100·00

From 947ft.

	Per Cent.
Moisture at 100° C.	5·60
Volatile matters	17 40
Fixed carbon (non-caking)	36·40
Ash	40·60
	100·00

FLINT DEPOSITS.

A recent discovery of water-worn flint pebbles, of which there are vast quantities between Cape Banks and Port MacDonnell, is stated to be of superior quality to the stone imported from Iceland for use in smelting of metals in ball mills. Several hundred tons have been sent to Broken Hill for trial, but the industry has been hampered by rough weather preventing loading of the material, which is deposited on the beach.

WHEAL SARAH.

(Also known as the Bundaleer Mine.) Work has been recommenced. The main shaft is on top of a hill, and, the water being difficult to cope with, a drive was started at foot of hill to drain mine to that level and save haulage to the top. The drive is in 200ft., and rails have been put down to run the ore to the dump. Good specimens of copper ore are being obtained.

CORUNDUM, &c.

The locality of the corundum discovery, reported by the Government Geologist in 1906, has been lately visited by Mr. W. B. Greenwood on behalf of the Mount Painter Corundum Monazite and Gem Syndicate, of Adelaide. He reports having found additional corundum-bearing outcrops one mile W. and three miles S.E. of Mount Painter, and a deposit of rutile and titanite one mile S. of Mount Painter. The assayer and analyst at the School of Mines reports as follows on the specimens brought down by Mr. Greenwood:—

"Micaceous schist, containing massive corundum, mostly of a blue color, but occasionally greenish, some of the latter containing minute specks of clear transparent oriental emerald.

"Other minerials of interest contained in the parcel were pink tourmaline in a hard yellow mineral (silicate of alumina and magnesia), probably iolite or an alteration product thereof, also large crystals of black tourmaline, titanite, and rutile."

The country in the neighborhood of Mount Pitts and Mount Painter comprises some of the highest and roughest portions of the main range. It is almost destitute of water, except occasionally in the winter season. An examination of the district is very desirable, but can only be undertaken after rain has fallen.

REPORT ON BORING OPERATIONS.

(By Mr. A. W. Matthews.)

During the half-year ending December 31st, 1909, boring operations have been confined to the Kadina and Copper Hill leases, the total boring being 1,312ft. 6in. This includes the continuation of No. 1 bore, Kadina Mine, from 441ft. to 456ft.; No. 2 bore, Kadina Mine, depth 400ft.; No. 3 bore, Kadina Mine, depth 400ft.; and No. 1 bore, Copper Hill Mine, depth 497ft. The plant was also taken down and re-erected three times.

No. 1 Bore, Kadina Mine (angle 10ft. in 100ft.)—This bore was continued from 441ft. to 456ft. 6in. For the last 150ft. we were drilling in footwall country, so boring was discontinued.

No. 2 Bore, Kadina Mine (angle 15ft. in 100ft.).—The first 15ft. we drilled through surface loam, limestone, then sandstone, followed by grey country rock mixed with calcite. This continued to 319ft. 6in., when a lode formation carrying a little sulphide was cut. We drilled on this formation to 323ft. 4in., when we again entered country mixed with bars of hard quartzite and felspar, which continued to 400ft., when boring was discontinued.

No. 3 Bore, Kadina Mine (angle 15ft. in 100ft.).—After passing through the surface loam and limestone we entered micaceous schist, followed by country rock mixed with calcite and felspar, which all showed a little mineral. This country continued to 329ft., at which depth the lode was cut, proving to be 2ft. wide, but of low grade. Boring was confined to 400ft. in footwall country, and then stopped, and the plant shifted to the Copper Hill lease, 10 miles from Kadina.

No. 1 Bore, Copper Hill (angle 15ft. in 100ft.).—The surface loam and limestone continued for 7ft., followed by sandstone and kaolin, which continued to 48ft. We then entered brown and grey country rock of a very broken and irregular nature and drilled in same to 200ft., when we met with very hard quartzite, which continued to 359ft. At this depth the hanging-wall of lode was cut, and we drilled through 7ft. of lode showing sulphide and mundic of low values. Drilling was continued to prove the footwall country for 130ft., and as no change was met, it was decided to stop and remove to a site further west on the line of lode. A trial was also made of a steel shot bit in this bore, a full report of which has been forwarded.

The various bores put down on the Kadina lease have proved that the lode continues to a depth, but where it was intersected by the drill the values were low and not of sufficient width to warrant developing.

On the Copper Hill lease the first bore has proved the lode to a depth of 367ft., where it was low grade. Further boring is being carried out on this lode to prove its value.

Prospecting Shaft, Wandilta Mine.—The prospecting shaft was continued to a depth of 107ft., when, owing to the heavy inflow of water, sinking was discontinued and a start was made to get ready for a 12in. Cornish plunger and lift to cope with same. Plats were cut E. and W. at the 60ft. level, also chamber cut out for cistern and bearers, and cistern made and put in. Bearers have also been put in shaft to carry pumps. The foundations for balance-bob and bob pits and engine beds were also cut out and beds concreted in, with holding-down bolts, in readiness for machinery. A large Lancashire boiler has also been built in. A 60-h.p. engine has been obtained from Waukaringa and is now on the mine, and 144ft. of 12½in. pumps were obtained from Ediacara, also capstan frame and various other pump gear. Contracts were let for draw lift and plunger with May Bros., of Wallaroo, and pump wheel, disc, balance-bob, sweep rod, &c., with the Union Engineering Co., Adelaide. Some of this machinery has been delivered on the mine and is now being erected. During the half-year we have had 10 parties of tributers working on the Wandilta and Kadina leases, on the old line of lode. Three of these parties opened up small shoots of grey and green ore, and worked same down to water level, when they encountered the old workings from which these same shoots had been worked. At present there are two parties at work near the south boundary of the Wandilta lease.

COPPER.

AVERAGE MONTHLY PRICE OF COPPER, JULY-DECEMBER, 1909.

	Standard. £	s.	d.		Best Selected. £	s.	d.
July	58	14	2	..	61	16	8
August	59	10	2	..	62	2	3
September	59	3	3	..	62	2	6
October	57	12	2	..	61	2	3
November	58	19	5	..	62	8	4
December	60	1	0	..	63	10	7
Average for the six months	59	0	0	..	62	3	8

RANGE OF PRICES—

December 31st	61	15	0
October 28th	56	11	3

AVERAGE PRICE OF STANDARD COPPER FOR THE LAST TEN YEARS.

	£	s.	d.		£	s.	d.
1900	73	2	5	1905	64	16	10
1901	66	19	1	1906	87	8	10
1902	52	8	3	1907	82	1	11
1903	58	3	2	1908	60	0	10
1904	59	0	7	1909	58	17	2

Average for the 10 years, £66 5s. 11d.

CRUSHING AND CYANIDING PLANTS.

RETURNS FROM GOVERNMENT BATTERIES AND CYANIDE WORKS FOR HALF-YEAR ENDED DECEMBER 31ST, 1910.

Name of Mine.	Locality.	Ore Treated. Tons	cwts.	qrs.	Gold Recovered. Ozs.	dwts.	grs.	Value of Gold. £	s.	d.	Average Yield per Ton, in Shillings.
MOUNT TORRENS.—GOVERNMENT BATTERY AND CYANIDE WORKS.											
Durdon	Blumberg	20	0	0	5	3	12	19	12	3	19
Grundy	Second Valley	6	6	0	2	7	16	7	14	11	25
Durdon	Blumberg	15	0	0	3	8	20	12	18	5	17
Schuberts	Mount Torrens	13	12	0	6	19	16	23	16	5	35
Parara	Ardrossan	4	16	0	0	13	11	2	7	5	9
Durdon	Blumberg	27	0	0	8	12	19	32	14	1	24
Clark	Lobethal	specimens		1	9	10	20	32	11	7	—
Durdon	Blumberg	23	15	0	6	13	14	25	9	4	21
Schuberts	Mount Torrens	12	5	0	14	4	21	51	8	9	85
Clark	Lobethal	specimens		1	6	17	13	23	7	7	—
Total		122	14	2	64	12	18	232	0	9	
Grand total since starting of battery		9,235	11	1	5,296	18	8	19,997	1	3	—

RETURNS FROM GOVERNMENT CRUSHING AND CYANIDING PLANTS—*continued.*

Name of Mine.	Locality.	Ore Treated.	Gold Recovered.	Value of Gold.	Average Yield per Ton, in Shillings.
		Tons cwts. qrs.	Ozs. dwts. grs.	£ s. d.	
PETERSBURG.—Government Battery and Cyanide Works.					
Lux	Olary	23 0 0	13 15 22	49 8 1	43
Scotchman	Teetulpa	5 0 0	3 11 19	13 5 8	53
Ironclad	"	4 6 0	0 11 19	2 1 1	9
Mount Grainger	Mount Grainger	6 5 0	0 19 2	3 7 3	11
Dustholes	"	10 0 0	1 18 2	5 18 6	12
Dustholes	"	15 0 0	3 4 22	11 17 8	15
Golden Junction	"	5 12 0	1 9 18	5 15 0	20
Nectar	Mannahill	4 7 0	5 0 12	22 11 11	103
Homeward Bound	"	2 17 0	6 9 13	25 17 0	181
Standard	Waukaringa	6 2 0	3 5 2	12 10 9	39
Emery	Bimbowrie	5 15 0	1 8 0	4 8 2	13
Lux	Olary	33 0 0	13 7 19	44 17 1	27
Homeward Bound	Mannahill	5 0 0	4 8 11	17 3 6	68
Jones	Oodla Wirra	specimens 1	38 6 0	153 4 0	—
Mount Grainger	Mount Grainger	6 0 0	4 10 12	17 10 1	41
New Milo	Wadnaminga	8 0 0	7 4 14	26 7 2	66
Lux	Olary	6 15 0	4 11 21	16 8 1	48
Golden Boomerang	"	4 8 0	2 6 17	7 17 2	35
Nectar	Mannahill	5 10 0	1 15 22	6 11 3	24
John Brown	Olary	5 15 0	3 0 11	9 10 8	33
Total		163 18 1	122 6 18	456 10 1	—
Grand total since starting of battery		3,944 19 1	3,722 2 44	13,820 2 3	—
GLENLOTH.—Government Battery.					
Parcel No. 40—Lone Hand		74 0 0	153 0 8	523 9 7	141
" " 41—Leahy and Bayley		9 10 0	16 0 11	51 4 5	108
" " 42—Blundell, F. W.		26 0 0	5 9 10	17 14 2	13
" " 43—Ryan, Kennewell, and Dressley		85 0 0	35 0 6	128 4 11	30
" " 44—Fabian's No. 3		45 0 0	133 9 18	456 2 1	203
" " 45—Lake View		5 10 0	7 17 5	26 14 4	97
" " 46—Gordon A		5 0 0	7 13 7	26 9 1	106
" " 47—Fabian's No. 3		36 0 0	55 17 12	127 14 1	71
" " 48—Lone Hand		26 0 0	35 17 8	128 12 10	99
" " 50—Fabian's No. 3		47 0 0	57 8 8	203 4 1	86
Total		359 0 0	487 13 21	1,689 9 8	93
Grand total to December 31st, 1909		1,588 0 0	1,674 19 2	5,622 1 5	71
TARCOOLA.—Government Battery.					
Parcel No. 142—Government Mine		4 10 0	15 9 21	54 0 9	240
" " 143—Walsh, J. J.		5 0 0	2 0 6	7 5 1	29
" " 144—Walsh, J. J.		10 0 0	61 14 4	227 8 2	455
" " 145—Carter, T.		7 0 0	8 1 3	30 7 5	87
Total		26 10 0	88 5 10	319 1 5	241
Grand total to December 31st, 1909		2,083 5 0	2,653 1 18	9,308 15 10	89

TOTAL BATTERY AND CYANIDE RETURNS FROM ALL PLANTS FOR SIX MONTHS ENDING DECEMBER 31ST, 1909.

Name.	Ore Treated.			Total Gold Recovered.			Value.			Average Yield per Ton, in Shillings.
	Tons	cwts.	qrs.	Ozs.	dwts.	grs.	£	s.	d.	
Mt. Torrens Government Battery	122	14	2	64	12	18	232	0	9	38
Glenloth " ..	359	0	0	487	13	21	1,689	9	8	94
Petersburg " ..	163	18	1	122	6	18	456	10	1	56
Tarcoola " ..	26	10	0	88	5	10	319	1	5	241
Wheal Ellen (Commonwealth) ..	194	0	0	39	10	0	126	13	1	13
Tarcoola Blocks Co.	745	0	0	1,944	0	0	4,375	0	0	117
Total	1,611	2	3	2,746	8	19	7,198	15	0	89

ARLTUNGA GOVERNMENT BATTERY AND CYANIDE PLANT.

Name.	Ore Treated.			Total Gold Recovered.			Value.			Average Yield per Ton, in Shillings.
	Tons	cwts.	qrs.	Ozs.	dwts.	grs.	£	s.	d.	
White Range, Excelsior	3	14	0	8	17	1	30	16	1	166
" "	6	8	0	10	2	19	38	1	4	117
" Luce's	14	3	0	28	19	21	105	14	8	149
" "	21	7	0	38	14	20	142	6	10	133
" Extended	8	12	0	11	4	22	41	6	11	97
" Associated	16	4	0	25	14	10	94	0	6	116
" Extended	13	10	0	20	6	19	75	0	10	111
" Luce's	25	0	0	52	14	20	197	8	9	128
" Extended	4	7	0	7	13	16	27	13	5	127
" Luce's	14	18	0	57	16	8	219	9	10	173
" "	10	17	0	14	16	13	54	1	6	294
Wheal Fortune, Extended	4	8	0	1	10	4	5	7	1	99
Valentine	27	10	0	14	8	0	24	9	7	24
White Range, Extended	7	14	0	18	17	8	67	8	5	18
" Excelsior	8	13	0	11	7	9	40	16	10	94
Valentine	34	2	0	8	7	12	27	12	9	16
White Range, Luce's	13	11	0	40	14	0	148	13	3	220
" Extended	5	4	0	4	8	16	15	5	11	59
" "	4	13	0	10	19	23	39	16	10	171
" Luce's	11	14	0	30	3	3	112	0	6	191
" "	4	1	0	4	13	17	16	12	0	83
Albion, Arltunga	4	5	0	1	16	14	6	6	11	29
Valentine	10	2	0	3	4	4	8	13	3	17
Total	274	17	0	427	12	5	1,639	4	0	114
Grand total since starting of battery to December 31st, 1909..	10,342	4	3	12,877	3	5	47,709	13	4	92

WINNECKE'S DEPOT GOVERNMENT BATTERY.

Reward and Coorong.....	7	10	0	13	5	17	51	6	3	137
Total since starting of battery to December 31st, 1909 ..	345	7	0	177	17	23	667	9	6	38

RETURN SHOWING QUANTITY AND VALUE OF METALS AND MINERALS FOR SOUTH AUSTRALIA AND NORTHERN TERRITORY EXPORTED DURING YEAR 1909.

	South Australia.		Northern Territory.	
	Quantity.	Value.	Quantity.	Value.
		£		£
Gold—Bullion, bar, ingot, &c.	—	—	583ozs.	1,997
Gold ores and concentrates	48cwt.	120	—	—
Copper—Ingot	102,432 "	307,094	—	—
Copper ore and concentrates	67 "	140	860cwt.	315
Copper matte	—	—	735 "	1,025
Tin ores and concentrates	2,777 "	11,000	8,769 "	32,668
Zinc, spelter, ore, and concentrates	105 "	63	—	—
Wolfram	—	—	111 "	410
Iron ore	92 "	2	—	—
Ores, clays, and minerals, N.E.I.	345 "	331	—	—
Total	—	£318,750	—	£36,415

ACCIDENTS ON MINES AND QUARRIES.

A gratifying feature of the past year's mining operations in mines and quarries was the infrequency of serious accidents. In all seven accidents were reported. In one case only was the result fatal, the remainder being generally not of a serious character. Act No. 858 of 1904, bringing quarries in the same category as mines as regards the controlling hand of the Chief Inspector of Mines, has been effective in safeguarding the interests of miners. The following table gives the number of accidents in mines and quarries since passing of the Act :—

ACCIDENTS IN MINES AND QUARRIES.

Accidents in Mines.				Accidents in Quarries.			
Year.	Total Number of Accidents Reported.	Number of Persons Injured.	Number of Persons Killed.	Year.	Total Number of Accidents Reported.	Number of Persons Injured.	Number of Persons Killed.
1904	5	1	4	1904	1	1	1
1905	3	1	3	1905	—	—	—
1906	5	—	3	1906	1	1	—
1907	8	4	6	1907	3	1	2
1908	5	4	1	1908	—	—	—
1909	6	5	1	1909	1	1	—

ENCOURAGEMENT OF MINING.—STATEMENT OF SUBSIDIES PAID FROM COMMENCEMENT TO DECEMBER 31ST, 1909.

Locality.	Name of Company or Person to whom Subsidy Granted.	Amount Advanced.			Amount Repaid.		
		£	s.	d.	£	s.	d.
Algebuckina	Algebuckina Gold Mining Syndicate	52	10	11	52	10	11
Barndioota, Hundred of	Warrakimbo Propy. Copper Mining Synd.	215	10	2	—		
Barossa	Barossa Enterprise Gold Mining Co.	232	2	6	—		
"	Enterprise Copper Mining Co., N.L.	150	0	0	9	16	0
"	Enterprise Excelsior (Barossa Amalgamated)	2,000	0	0	—		
"	Lady Alice Gold Mining Co.	1,797	2	3	—		
"	Victoria Hill Amalgamated Gold Mining Syn.	38	12	6	—		
Bimbowrie	Mount Victoria Mine	50	0	0	—		
Blackwood	Mount Malvern Silver Mining Co.	491	3	6	—		
Blinman	Nilpena Copper Mining Co., Ltd.	290	5	3	—		
Burr Well	Paull's Consolidated Copper Propy., N.L.	525	0	0	—		
Callington	Callington Copper Mining Co.	148	8	7	—		
"	Paringa Mining Syndicate	399	16	8	244	0	0
"	Paringa and West Kanmantoo Consolidated Copper Mine, N.L.	950	0	0	—		
"	Pioneer Gold and Copper Mining Syndicate	95	15	6	—		
Clarendon	Mount Malvern Silver-lead Mining Co., N.L.	1,347	15	3	—		
Currency Creek	Currency Creek Copper Mining Co.	28	6	5	—		
Echunga	Crystal Gold Mining Co.	563	17	6	176	7	6
"	Wolters, F. C., & Co	25	0	0	—		
"	Echunga Proprietary Hydraulic Gold Sluicing Co., N.L.	500	0	0	20	0	0
Ediacara	Ediacara Consols Silver Mining Co., N.L.	651	12	1	375	17	0
Farina	Warra Warra Propy. Copper Mines, N.L.	322	4	11	322	4	11
Fifth Creek	Fifth Creek Central Silver and Copper Mining Co., N.L.	253	2	4	—		
"	Stainbank, A. T.	70	14	11	—		
Fortress Hill	Fortress Hill Mining Syndicate	60	0	0	—		
Glenloth	Glenloth Mining, Battery, & Options Co., N.L.	515	4	7	515	4	7
"	Glenloth Wells Pioneer Blocks Co., Ltd.	100	0	0	22	18	5
"	Hakendorf, C. H., and Williams, J. (Glenmarkie Mine)	200	0	0	—		
Glen Osmond	Eagle Silver Mining Co, Ltd.	500	0	0	—		
Gumeracha	Gumeracha Gold Mining Syndicate	75	0	0	—		
"	Watt's Gully Gold Mining Co.	50	0	0	—		
"	Watt's Gully Reef Claims	50	0	0	—		
Habndorf (near)	Mount Pangæus Gold Mining Co.	56	1	4	—		
Kadina	Copper Hill Mining Co., N.L.	391	15	0	—		
"	Wallaroo Central Mining Co., N.L.	500	0	0	—		
"	Polmear, W. J. L.	800	0	0	—		
Kangaroo Island	Kohinoor Gold Mining Co., N.L.	137	17	0	—		
"	Kohinoor Mine (H. G. Taylor)	162	3	0	—		
Kuitpo, Hundred of	Blackfellow's Creek Gold Mining Co., Ltd.	660	6	7	35	0	0
"	McMurtie's Claims	199	19	11	—		
"	Mount Monster Gold Mining Syndicate	350	0	0	1	0	0
Leigh's Creek	Leigh's Creek South Coal Mining Co., N.L.	95	16	4	95	16	4
Maitland	Parara Mining Co., N.L.	571	3	6	—		
Mannahill	Royal Charlie Gold Mining Co.	153	18	5	—		
"	Victoria Tower Mining Co., N.L.	345	18	9	90	0	0
"	Westward Ho Mine (Dr. H. Dixon)	1,000	0	0	—		
Mochatoona	Hunter Bros. (Lady Millicent Mine)	100	0	4	—		
Mount Fitton	Northern Mining and Smelting Co., N.L.	350	0	0	—		
Mount Grainger	Ireby Gold Mining Syndicate	35	4	3	—		
"	Mt. Grainger Ironclad Gold Mining Syn., Ltd.	21	18	10	—		
"	Heithersay, J., Mt. Grainger Medora Mines	77	7	7	—		
"	New Mount Grainger Gold Mines, N.L.	393	7	1	220	0	0
"	Medora and Grainger Gold Mines Syndicate, N.L.	344	2	2	—		
Mount Pleasant	Duke of Cornwall Gold Mining Syndicate	458	17	4	43	10	0
Mount Torrens	Mount Torrens Gold Mining Co.	1,000	0	0	—		
Musgrave Ranges	Musgrave Ranges Prospecting Association	47	2	9	—		
Mutooroo	Mutooroo Copper and Silver Mining Co., Ltd.	500	0	0	500	0	0
"	Cockburn Copper Mining Co., N.L.	273	18	5	—		
Myponga	Wohler, H., & Co.	20	0	0	—		
Nackara	Nackara Proprietary Copper Mining Co, N.L.	100	0	0	—		

ENCOURAGEMENT OF MINING.—STATEMENT OF SUBSIDIES PAID—*continued.*

Locality.	Name of Company or Person to whom Subsidy Granted.	Amount Advanced. £	s.	d.	Amount Repaid. £	s.	d.
Nackara	Nackara Proprietary Gold Mining Syndicate	100	0	0	—		
Nairne	New Banksia Gold Mining Syndicate	250	0	0	—		
"	North Nairne Gold Mining Co.	500	0	0	—		
New Luxemburg	Mingary Gold Mining Co.	650	0	0	—		
New Luxemberg	Queen Bee Mining Co., N.L.	250	0	0	250	0	0
Olary	King's Bluff G.M. Co., N.L.	200	0	0	—		
Palmer (near)	Bevilaqua & Angel	57	18	0	—		
Port Lincoln	Lady Franklin Syndicate	200	0	0	40	0	0
Prospecting in north-west of State	North-West and West Australian Pros. Co.	104	9	7	—		
Prospecting on proposed line to Queensl'd Border	Wheal Turner Copper Mining Co., Ltd.	1,000	0	0	—		
Quorn	Quorn Manganese and Silver Mining Co.	10	9	10	—		
Sliding Rock	Sliding Rock Copper Proprietary, N.L.	2,000	0	0	5	12	0
Strathalbyn, Hund. of	Commonwealth Silver-lead Co., Ltd.	750	0	0	—		
Tarcoola	North-West Prospecting Association, N.L.	150	0	0	—		
"	Tarcoola Blocks Gold Mining Co., Ltd.	3,995	5	2	—		
"	Tarcoola Enterprise Gold Mining Co., N.L.	100	0	0	19	10	4
"	Tarcoola Proprietary Gold Mines, N.L.	150	4	4	9	15	0
Teatree Gully	Teatree Gully Gold Mining and Pros. Assn.	234	5	7	—		
Teetulpa	Great Ironclad Gold Mining Co.	218	6	9	—		
"	Morning Star Gold Mining Co.	68	4	6	—		
"	Nil Desperandum Teetulpa Devt. Co., N.L.	64	14	1	20	5	6
"	Teetulpa Mining and Crushing Co.	349	11	4	—		
"	Teetulpa Prospecting Syndicate	49	15	6	—		
"	Teetulpa Prospecting Association	14	7	3	—		
Wadnaminga	Countess of Jersey Gold Mining Co., N.L.	321	0	0	—		
Wallaroo	Yelta New Copper Mining Co, N.L.	1,000	0	0	—		
"	Hamley Copper Mining Co.	1,000	0	0	—		
Waukaringa	Alma Extended Gold Mining Co.	3,000	0	0	22	5	0
"	Kirkeek's Treasure Gold Mining Co.	691	8	1	—		
"	New Ajax Consolidated Gold Mining Co., N.L.	750	0	0	—		
"	Rees, R., Ajax Mine	500	0	0	—		
"	New Alma and Victoria Gold Mining Co., Ld.	3,000	0	0	3,000	0	0
Winnininnie	Winnininnie Gold & Silver Propy. Co., N.L.	86	3	6	—		
Wonna	Golden Point Claims	50	0	0	—		
Woodside	Bird-in-Hand Gold Mining Co, Ltd.	3,000	0	0	—		
"	Eureka Gold Mining Co., Ltd.	1,500	0	0	—		
"	New Era Gold Mining Co, Ltd.	1,000	0	0	—		
"	Woodside Boring and Mining Syndicate	422	17	11	—		
Worturpa	Backhouse, T. S.	100	0	0	—		
"	Worturpa Exploration and Mining Co., Ltd.	800	0	0	—		
	Adelaide Crushing, Grinding, and Amalgamating Mill Co.	100	0	0	—		
	Totals £	50,685	5	4	6,091	13	6

ASSAYS AT SCHOOL OF MINES.

NUMBER OF ASSAYS MADE FOR PUBLIC PURPOSES AT THE SCHOOL OF MINES ASSAY DEPARTMENT DURING THE SIX MONTHS ENDED DECEMBER 31ST, 1909.

	1909.						Totals.
	July.	August.	September.	October.	November.	December.	
Assays for the Warden of Goldfields	59	9	189	58	39	60	414
Assays for the Government Geologist	7	—	21	—	—	3	31
Free public assays	81	83	97	115	89	83	548
Totals	147	92	307	173	128	146	993

DECENNIAL RETURN SHOWING OUTPUT AND VALUE OF VARIOUS METALS AND MINERALS PRODUCED IN SOUTH AUSTRALIA SO FAR AS CAN BE ASCERTAINED.

Year.	Gold.		Silver.		Silver Lead Ore.		Copper.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Ounces.	£	Ounces.	£	Tons.	£	Cwts.	£
1900	3,721	14,494	—	—	—	17,526	97,727	371,920
1901	4,918	16,613	—	—	1,410	11,357	134,719	468,606
1902	7,231	24,873	—	—	2,680	19,740	136,937	388,162
1903	8,650	28,650	7,086	804	211	1,267	129,812	417,116
1904	17,897	76,025	—	—	—	—	125,560	382,356
1905	10,983	45,853	—	—	—	—	130,959	426,511
1906	8,037	27,000	801	104	—	—	164,160	718,609
1907	5,609	20,540	5,845	780	1,000	11,000	158,620	690,000
1908	2,908	12,300	—	—	900	9,000	112,554	338,000
1909	7,111	30,206	1,660	167	70	416	113,940	331,584
Totals....	—	296,559	—	—	—	70,306	—	4,535,864

Year.	Copper Ore and Regulus.		Lead.		Ironstone Flux.		Limestone Flux.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
	Tons.	£	Cwts.	£	Tons.	£	Tons.	£
1900	2,367	22,526	7,650	4,382	—	—	—	—
1901	1,866	23,011	1,360	722	—	—	—	—
1902	2,579	42,550	43,557	22,303	—	—	—	—
1903	7,069	54,922	14,408	8,799	84,932	46,712	—	—
1904	3,051	24,597	—	—	46,687	27,091	43,440	6,516
1905	2,563	28,434	1,040	369	84,483	48,577	44,498	4,791
1906	—	—	1,000	550	75,226	33,852	31,940	4,791
1907	—	—	—	—	84,600	38,100	31,100	5,800
1908	—	—	—	—	88,000	39,600	29,500	6,000
1909	1,230	4,003	140	90	16,120	8,296	13,765	2,464
Totals	—	200,043	—	37,215	—	242,228	—	30,362

Year.	Phosphate Rock.		Crude Salt.		Other Metals and Minerals.	Total Value.
	Quantity.	Value.	Quantity.	Value.	Value.	
	Tons.	£	Tons.	£	£	£
1900.....	—	—	—	—	411	431,259
1901.....	—	—	—	—	2,219	522,478
1902.....	—	—	—	—	742	498,375
1903.....	1,000	1,000	40,000	12,000	100	571,371
1904.....	3,000	3,000	40,000	12,000	198	531,783
1905.....	5,000	5,000	32,500	13,000	1,261	573,796
1906.....	5,850	5,850	55,000	27,500	2,209	820,465
1907.....	8,000	8,000	75,000	37,500	2,500	814,220
1908.....	11,000	11,000	75,000	37,500	4,500	457,900
1909.....	3,772	3,697	51,407	25,594	3,873	413,390
Totals	—	37,547	—	165,094	18,013	5,635,037

REPORTS FORMING ADDENDA TO THE "RECORD OF MINES."

Wheal Ellen Mine (*vide* Record of Mines, 1908, page 191).—The principal work at present in progress is stoping and driving at various levels. At the 134ft. level a drive has been put in N. 170ft. to the gossan shaft, and from the gossan shaft N. for another 150ft. Since the present company started 1,255 tons have been stoped from this part and crushed on the mine with a 5-head battery, for a return of 253oz. of smelted gold. The ore body in all the stopes at present is narrow, varying from 6in. to 18in. wide. The S. drive at this level is in 8ft., and the ore body, consisting of sulphide 6ft. wide, is well defined, and no doubt will continue S. for some distance. At 150ft. level preparations are being made to stope the sulphide ore body, which is here 45ft. long and fully 12ft. wide. At 200ft. level in the S. drive the sulphide ore body is proved to be 48ft. long and 10ft. wide, with no hanging-walls showing. A trial parcel of 4 tons from this part gave 48 per cent. sulphur. At 240ft. level, only recently unwatered for the first 50ft. from the plat, the sulphide ore body in the S. drive is from 4ft. to 8ft. wide, but further S. it gradually narrows to about 18in. wide. The N. drive is in 15ft., the lode being 2ft. 6in. wide. In both drives the ore body appears to be as strong and well defined as in the upper workings, and is likely to continue down. From the 130ft. to 240ft. level the lode is highly promising, from 6ft. to 10ft. wide, and containing a good percentage of silver-lead and sulphur. Large quantities of ore are available, and with present facilities for working and hauling, fair profits may reasonably be expected. Sixteen samples taken from various parts of the workings gave an average of 6dwts. gold; two, in which the sulphur was low, assaying 1oz. 17dwts. each. The average silver contents of these samples was 4oz. 7dwts., lead 12 per cent., and sulphur 33 per cent.

Virtue Gold Mine.—Situated seven miles S.E. from Willunga. The outcrop of a well defined quartz reef, bearing N.E. and underlying S.E at 45°, can be traced for three-quarters of a mile. The principal workings are situated on the side of a steep hill, about 250ft. above the Meadows Creek. A tunnel is driven N.E. on the course of the reef for 175ft. The ore-bearing material is chiefly ferruginous quartz, from 9in. to 12in. wide, carrying a little free gold, which generally occurs in shoots in the reef. At a distance of 132ft. in the tunnel the reef is cut off on a fault and displaced, making a throw of 8ft. N.W. At a point about 40ft. N.E. from the end of the tunnel, and 103ft. higher up on the hill, an underlay shaft has been sunk on the line of lode for 35ft. The reef is well defined, and from 9in. to 15in. wide. This shaft, if continued to intersect the tunnel, would prove the value of the lode to that depth, and also ventilate the mine, besides making over 100ft. of backs available for stoping. Three chains N E. of the last-mentioned workings No. 2 underlay shaft was sunk to 25ft. on the reef, which is from 6in. to 9in. wide in all parts of the workings; the reef is well defined, and is likely to continue down. Its value in bulk is low, but may improve at greater depth. The best and cheapest way to prove the permanency of the reef at a deeper level would be to sink a winze, which could be started to advantage at a point near the tunnel entrance. The assays of a number of samples ranged from traces to 2dwts. of gold.

The Ajax (*vide* Record of Mines, 1908, page 196).—Situated eight miles S.W. from Waukaringa. Workings at present are confined to No. 4 shaft, at 130ft. level. A party of eight men has contracted to raise 600 tons of ore, and work is progressing satisfactorily. So far, besides doing preparatory work, 100 tons of ore have been raised. Insufficient water supply causes work to be carried on at a disadvantage, and the ore has to be carted eight miles for treatment at Waukaringa. The mine is equipped with a good crushing plant, and it appears that the ore is of fair uniform value throughout the workings. To overcome the water difficulty I would recommend that bore holes be put down to ascertain the depth necessary to obtain a sufficient supply for crushing and cyaniding.

The Scotchman and Ironclad.—Situated Ironclad Gully, Teetulpa (*vide* Record of Mines, 1908, page 267). Five well-defined reefs traverse the property, bearing N., with an E. underlay 12° from the vertical. These are true fissure lodes, striking through the country rock at right angles to its bedding. The lodes are parallel, and are from 20ft. to 50ft. apart, and the veinstone consists of quartz, gossan, iron, and iron pyrites, varying in width from 6in. to 3ft., all carrying gold. There are also a number of bed-rock veins from 6in. to 15in. wide intersecting and crossing the main reefs at right angles; and, in my opinion, it is possible that the best results will be found near the point of intersection. In the past a number of shafts from 15ft. to 100ft. deep have been sunk. In all the workings the reefs are well defined and strong, with every appearance of continuing to depth. The principal work at present is confined to the Scotchman reef, where a shaft has being sunk on the lode. It is down 30ft., and the reef at the bottom is quartz and gossan from 6in. to 9in. wide, carrying a fair amount of gold. Five tons recently treated at Petersburg gave a return of 10dwts. 17grs of gold by battery, with 4dwts. 23grs. in the tailings. The position of the leases is a very favorable one, comprising a large portion of the crown of a hill and gullies, whence a large amount of alluvial gold was obtained in the past, which must have been shed from one of the reefs in the vicinity. The matrix of all the reefs traversing the property appears highly favorable for carrying good gold. The Scotchman reef could be further developed to advantage by continuing the present shaft to 100ft. or more, with drives N. and S. along the line of strike. It is quite necessary, in my opinion, that more developmental work should be done before going to expense of high-class machinery.

Rapid Bay Copper Mine, also known as Yattagolinga (*vide* Record of Mines, 1908, pages 16 and 155).—Situated on the sea coast, three miles from Second Valley, comprising 106 acres, 80 acres being on freehold property. Several mineralised beds resembling lode formations traverse the leases comformable to the strike of the stratified rocks, which bear E. and W., underlying 47° to S. Several shafts have been sunk on the formation to depths varying from 20ft. to 100ft., these being about 7 chains from the shore and 400ft. above sea level. Ferruginous calcite from 2ft. to 8ft. wide has been disclosed, containing specks of malachite and copper pyrites, the bulk being apparently of low grade, but isolated patches of high grade ore have been obtained A well-defined formation of ferruginous calcite, 2ft. to 5ft. wide, is traceable for 30 chains, being a little above high-water level. Underlay shafts have been sunk 15ft. and 30ft. on this, from one of which 8 tons of 12·6 per cent. ore were obtained. The extent of deposit was not determined, owing to sea spray partially flooding the workings. On the N. side of the cliffs, and 50ft. above sea level, a vertical shaft is down 80ft., and 8 chains E. from this a tunnel was put in, 10ft. above sea level, for 120ft. At 30ft. a well-defined leader was met, and a drive for 25ft. along its course gave several tons of fair grade ore. A sample taken from this part gave 6 per cent. of copper. The best ore appears to occur in isolated pockets and bunches, with extensive bodies of low-grade ore between. So far the workings are shallow, and the rich pockets will possibly be found to be more extensive and the lodes of fairly uniform value when developed at greater depth. This could be done to best advantage by sinking a new main shaft E. from the S. workings. The country rocks are hard, and considerable capital will be necessary to fully explore the leases. Being close to the Rapid Bay jetty the ore can be shipped with rapidity. At a meeting of directors in November, 1909, it was decided to increase the capital, to enable the company to accept the Government offer to subsidise the mine to the extent of £500 and loan a diamond drill.

Kirkeek's Treasure Gold Mine (*vide* Record of Mines, 1908, page 225).—The Inspector of Mines visited this mine on August 25th, and reported that the operations are at present confined to stoping at 30ft. from the surface. The ore body already exposed is fully 300ft. long, from 8ft. to 20ft. wide, and consists of ferruginous quartz and iron veins carrying gold. One hundred tons recently treated gave 15dwts. of gold from battery and tailings. Inadequate water supply hampers the continuous working of the mine, and entails extra expense in getting things in order after stoppages. The country rock is hard quartzite. A shaft has been sunk 340ft., giving water at 301ft., but not in sufficient quantity to keep the crushing

plant going continuously. Several boreholes, to determine the depth and true position of the main water channels, are desirable, and would probably make the mine a successful venture, as the ore body is large and promising, and contains both coarse and fine gold.

Glamorgan, formerly Alma Extended (*vide* Record of Mines, 1908, page 198).—Having been idle for a length of time many repairs were necessary to crushing plant before it could be utilised. The company have been successful in procuring a machine suitable for those parts where firewood and water are scarce. The plant consists of 14-h.p. suction gas engine to drive 10-head mill of 900lbs. each at 96 drops per minute, crushing 15 tons in eight hours. Three hundred tons of fairly hard lode material was recently crushed, the cost of gas being equal to 2½d. per ton of ore crushed. The cost when steampower and wood for fuel was in use was 1s. 6d. per ton. A saving is effected in this direction, but a longer trial is necessary to compare the actual cost of running. Repairs are necessary to the main shaft, 470ft. deep, before hauling can be resumed. The mine is being unwatered, with a view to further trial of the different levels, and it is intended to explore for the shoot of ore in the Alma and Victoria, where good results were obtained, and which appears to be from 40ft. to 100ft. wide. To locate this on the Glamorgan Mine a series of bore holes would be cheapest and most expeditious, and enable the most suitable site for a drive to be selected.

Flinders Copper Mine (*vide* Record of Mines, 1908, page 56).—Several shafts have been sunk on separate lodes to various depths, and the main working shaft, judging from the dump, must be fully 200ft. deep. The lode material visible in the dump is chiefly ferruginous quartz, containing carbonates and yellow ore. At time of inspection no work was being carried on.

Iron Mount Mine.—Situated five miles N.W. from Tumby Bay. A large ironstone formation traverses the property, bearing N.E., which can be traced on top of the hill, 250ft. above the plain, for fully one mile. A considerable amount of ironstone from open quarries has been sent away for fluxing purposes. At the foot of the hill a tunnel has been put in for 140ft. The material passed through was chiefly slate, kaolin, and iron, in alternate layers, from 8in. to 15in. thick. For the last 3ft. the ironstone is more solid, and appears to be the main body. About 20ft. E of the tunnel a vertical shaft has been put down to 80ft. through material similar to that in the tunnel. So far as this large formation has been tested it contains comparatively no minerals of any commercial value. A sample from face of the tunnel gave a trace of gold.

Paringa Mine.—Previously reported on (*vide* Record of Mines, 1908, page 114). The main working shaft on the property is down a total depth of 255ft., and is divided into two compartments, each fitted with runners for cage and water tank, and is also equipped with poppet heads and good winding plant. At the 240ft. level in the main shaft a plat has been made, and a crosscut driven E. from it for a total distance of 200ft. At a point 109ft. in the crosscut ore-bearing material was intersected, which proved to be only a small patch or pocket; 33ft. of driving was done on its course N., where it pinched out to 1in. thick. At a point 175ft. in the crosscut No. 2 formation was intersected, which consists chiefly of schist containing small bunches of yellow ore. Driving N. on the course of the lode has been done for a short distance, in which it is said fair patches of high-grade ore were obtained, yielding 21 per cent. copper; but apparently, from the limited amount of work done on the formation, it proved to be of low grade in bulk. From the last lode the crosscut has been extended 25ft. E., and appears from indications in the face to be getting near Allan's lode. The crosscut should be continued E. to intersect Allan's and Earle's lodes so as to prove their width and value at this level, and, if they proved payable, rises could be put up on them to connect with the 120ft. level workings. This would open out the mine, and make 180ft. of backs available for stoping out on each lode. The W. crosscut at the 240ft. level is in a total distance of 180ft. At a point 145ft. in from the shaft the "Giant's Grave" lode was intersected. Driving N. on its course has been carried in for 51ft. The formation for the distance followed is 4ft. wide, and consists of schist and quartz, carrying copper pyrites and bornite. The best part of this lode is about 12in. wide close to

the hanging-wall, and the other 3ft., next to foot-wall, is poor, and appears to carry little or no value. Sample taken across the face, including the hanging-wall vein, for 4ft. wide, gave 3 per cent. copper, and one taken from the hanging-wall vein only gave 2·9 per cent. copper. About half-way in the drive, underhand stoping has been carried on for a length of 10ft. and 3ft. deep. The hanging-wall vein is from 9in. to 12in. wide of high-grade ore. A sample from it gave 24·2 per cent. copper. To work this lode successfully, and obtain a fair-grade product for the treatment plant, it will be necessary to extend the drives along the line of lode, put up rises, etc., and make more places to operate on, so that a sufficient quantity of ore could be obtained from the hanging-wall portion of the formation to keep the concentrating plant going: because, in my opinion the footwall portion of the formation will not pay to treat. At the 120ft. level a considerable amount of crosscutting and driving has been done, and three ore-bearing formations have been intersected and operated on. The most E. one (Allan's lode) has had a drive carried in N. on its course for a distance of 60ft., and a fair amount of stoping has been done over the drive. The ore body is from 1ft. to 3ft. wide, and consists of schist, quartz, and iron oxide, with carbonates of copper all through the matrix. Sample taken from the stope gave 6·5 per cent, and one from the face of the drive 2 per cent. of copper. Driving S. on Allan's lode has been carried in for a considerable distance, where it has been connected with underlay workings carried down from the surface, from which, it is said, large quantities of high-grade ore were obtained. Judging from the amount of work done and the quantity of ore obtained from the shallow workings on the various lodes traversing the property, the future prospects of the mine at the 240ft. level and deeper, where all the ore bodies are practically intact (except for the little work done on the Giant's lode), is highly encouraging. Developmental work should be carried on at this level to prove the various lodes, and open out the mine by winze-sinking and rising, to connect the 240ft. and 120ft. levels, which would make available on each lode about 160ft. of backs to operate on. When the above-mentioned work is being done, there would be a much better chance than at present, and at less cost, to get a sufficient supply of ore to keep the concentrating plant continuously working, and probably on higher grade ore than can possibly be obtained from the limited space operated on at the present workings. Recently the mine was equipped with treatment plant, consisting of large Cornish boiler, horizontal engine, stone-breaker and rolls, and also one of May's double jiggs of five compartments, and a new tram-line made from the shaft to the dressing floor, making it convenient to take the material direct from the shaft to the plant. A parcel of 30 tons of ore from the Giant's lode (which in bulk is of a low grade) has been treated by the new plant. The concentrates obtained were not up to expectation, owing chiefly to the quantity of rubonite (or garnet rock) in the formation, which is heavy and difficult to separate from the ore. Had the concentrating plant been working hard at the time of inspection a much better idea could be formed as to its utility and capacity for treating the material put through.

Samples of concentrates from				No.	1	hutch	gave	2 6	per cent.	copper.	
"	"	"	"	2	"	"	3·2	"	"		
"	"	"	"	3	"	"	5·1	"	"		
Bulk sample from ore dump				No.	1	gave		1·6	"	"	
"	"	"	"	"	"	2	"	2·2	"	"	

If that which is suggested in another part of this report is carried out, viz., keeping the foot and hanging wall portion of the Giant's lode separate and treating the latter only, it would bring the concentrates up to a much higher grade.

New Milo.—This property comprises a 20-acre gold lease, No. 1452, situated at Wadnaminga. Work is carried on at present by two men in an underlay shaft, situated 3 chains E. of the main shaft. Stoping operations are in progress from the W. drive at 60ft. level. The lode is from 12in. to 15in. thick, and consists of quartz and iron oxides carrying gold. Recently 8½ tons of ore from the mine were treated at the Petersburg Cyanide Works, and gave a return by battery of 9dwts. 12grs. of gold per ton, and from the tailings 9dwts. 6grs. of gold per ton. The mine is looking well, and the men expect to have another parcel of ore ready in a few weeks to send away for treatment. Previously reported on (*vide* Record of Mines, 1908, page 322).

West of the Golden Record Gold Mine, and adjoining it, Mr. H. Thiede is carrying on prospecting work at shallow levels on some small leaders, with a view of discovering the continuation W. of the run of rich gold operated on in the Golden Record Mine.

Commodore Silver-Lead Mine.—Situated about two miles from Giles' Nob, and about 30 miles S.E. from the Mannahill Railway Station. A large lode formation traverses the property, bearing N.E., dip S.E., and consists of irregular large masses of ferruginous quartz from 2ft. to 10ft. wide, containing carbonates and sulphide of lead. At 50ft. in No. 1 shaft, a drive in the lode has been carried in for a distance of 30ft. S.E. At a point 20ft. in from the drive a winze has been sunk to a depth of 54ft. The part of the lode sunk on consists of micaceous schist and quartz, which appears to contain no value at that point. Over the drive, stoping operations have been carried on for a length of 30ft. The ore body consists mostly of quartz, from 4ft. to 10ft. wide, carrying carbonates and patches of galena. About 120ft. S.E. of No. 1 shaft a vertical shaft has been sunk to a depth of 80ft. At that level a crosscut has been put in for a distance of 145ft. Recently a start was made to put this shaft in order and cleaning out the crosscut, preparatory to carrying in a drive to intersect the winze. The lode formation disclosed in all the workings is of a bunchy character and wide, but it is quite probable that at a greater depth it will be found to be more defined and compact. This mine was formerly known as the Prince Albert (*vide* Record of Mines, 1908, page 187).

Homeward Bound.—This property is situated 8 miles W. of Mannahill. Recently the Homeward Bound Mine and the Klondyke were amalgamated. The same line of lode traverses both properties, which in future will be developed to a greater depth from the Homeward Bound lease. No. 2 underlay shaft, which at present is down a total depth of 85ft., will be continued down to a depth of 200ft. At that level the intention is to drive on the course of the lode E. and W. to the boundary, which will prove the value of the ore body for a considerable length along the line, and make available great quantities of ore for stoping from that level to the present working. The crushing mill on the property will be overhauled and a considerable amount of improvement done to it, so that the ore in future can be crushed and treated on the mine. Stoping operation is in progress W. of No. 2 shaft, and the lode throughout the workings is well defined and likely to continue down. It consists of calcite and quartz carrying gold, which occurs at times in rich patches associated with bismuth. Previous reports will be found in Record of Mines, 1908, pages 245 and 246.

Nectar Gold Mines.—Situated seven miles N.W. of Mannahill. The principal work carried on at the mine at present is chiefly stoping at a depth of 15ft. from the surface. The formation operated on consists of brown iron ore and quartz, from 4ft. to 6ft. wide, carrying gold; but the best and richest gold is generally found in the iron veins traversing the formation. A parcel of ore, weighing 4 tons 7cwts., from the workings was recently treated at the Petersburg Cyanide Works, and gave a return of 1oz. 7dwts. of gold per ton. A sample taken from the lode for a width of 5ft. gave 14dwts. of gold per ton, and one taken from a dump of 200 tons of second class ore on the surface gave 3dwts. of gold per ton. The prospects of the mine are encouraging, and warrant shaft-sinking to develop the lode at greater depths (*vide* Record of Mines, 1908, page 243).

No Gammon Gold Mine.—This property is situated half a mile N.E. from the Nectar Mine. No work appears to have been done on this mine for a considerable time. At various points along the block several shafts have been sunk to shallow depths, disclosing lode formation consisting chiefly of quartz and iron veins, from 18in. to 24in wide, which appears favorable for carrying gold (*vide* Record of Mines, 1908, pages 241 and 243).

Hooper and Boxer's Gold Mine.—Situated three-quarters of a mile N.E. of the Ajax Gold Mine. A well-defined lode traverses the block, and can be traced on the surface for a considerable distance bearing N.E. and S.W. with an underlie N.W. It appears to be a continuation in a N.E. direction of the reef operated on in the Ajax Mine. An underlay shaft has been sunk on the lode to a depth of 108ft. At the bottom drives have been carried in each way on the reef for a distance of 8ft. The reef in the drives and down the shaft consists of ferruginous quartz and gossan,

from 6in. to 12in. thick, carrying gold; 6 tons 15cwts. treated recently from the bottom workings gave a return of 13dwts. 15grs. of gold per ton. From present appearances the prospects of the mine are very promising, and the reef is well defined and is likely to continue down to a great depth. Bulk sample taken from the bottom of the shaft gave by assay 12dwts. of gold per ton, and a sample taken from the side of the shaft gave 2dwts. of gold per ton.

Ding-Dong Mine.—On freehold land, situated four miles E. of Nairne township and is comprised of 100 acres, leased for 21 years. Prior to 1901 it appears that a considerable amount of work had been carried on intermittently on two of the formations traversing the property, but for the last seven or eight years very little work has been done on the mine. Operations were resumed eight months ago, and since then good progress has been made. There are two fairly-defined parallel formations traversing the block, bearing N.W. and S.E., and going down nearly vertical. They are about 200ft. apart, with strong indications on the surface of other ore bodies existing in the country between the two main lodes. The N. lode, on which a considerable amount of work has been done in shaft-sinking and open-cut workings along the line of strike for a length of four chains, has disclosed a formation from 12ft. to 15ft. wide, consisting of schist and a little quartz, with veins of high-grade ore from 6in to 10in. wide. On the foot and hanging walls, a large portion of the formation between the veins is poor, and it could be left, and the veins worked as separate lodes. Two underlay shafts have been sunk on the hanging-wall portion of the N. lode to a depth of 100ft. and 150ft. respectively. Judging from the amount of work done, a large quantity of high-grade ore must have been obtained from these workings. At present both shafts are full of water to within 70ft. of the surface, which appears to be very densely saturated with copper in solution. A small quantity of water is hauled out of one of the shafts once a day, and is run into a pit partly filled with scrap iron. By this primitive treatment a fair quantity of precipitates is obtained. In my opinion, with a proper up-to-date precipitating plant of a sufficient capacity to treat all of the water in the mine, a great quantity of precipitates would be produced that should pay handsomely. About 100ft. N.W. from the main workings the sinking of a prospecting shaft is in progress on the footwall portion of the N. lode, and is down a total depth of 40ft. The formation in the bottom is 3ft. wide, with a nice vein of high-grade ore on each wall. A sample taken from the hanging-wall vein, which is 6in. wide, gave 23·6 per cent. copper and 2ozs. 12dwts. silver per ton; and a sample from the footwall vein, 10in. wide, gave 26 2 per cent. copper and 2ozs. 6dwts. silver per ton; and another from ore on surface, bagged for first-class ore, gave 33·6 per cent. copper and 5ozs. 14dwts. silver per ton; also a sample from seconds gave 25·8 per cent. copper and 4ozs. of silver per ton. On the S. lode a considerable amount of work has been done to shallow levels along the line of lode for a length of five chains. The ore body disclosed in the various workings consists chiefly of quartz and schist, from 1ft. to 2½ft. wide, with carbonates through the matrix. A sample taken from a depth of 4ft. gave 5·5 per cent. copper, and another taken from S.E. end of workings gave 1·9 per cent. copper. From a hole 5ft. deep, sunk on No. 1 vein between the N. and S. lodes, a sample gave 1·3 per cent. copper, and one taken from No. 2 vein also gave 1·3 per cent. copper. At the bottom of the hill, 150ft. vertical below the top of the main shaft, a tunnel was started some years ago, and it extends into the hill in the direction of the main workings for a distance of 150ft. The tunnel is in a good position, and if it was cleaned out and continued a further distance of 250ft. the N. lode should be intersected. This would drain the water from the workings to that level and make 160ft. of backs available to operate on. Judging from what can be seen in the old and present workings, the future prospects of this mine are highly encouraging and has a fair chance, when properly developed and worked on a more extensive scale, to become highly remunerative. For the future working of the mine I would advise that the prospecting shaft be continued down to at least 100ft., and a crosscut put in at that point to intersect the hanging-wall vein. This would make 100ft. of backs available on each vein, and also a few hundred feet of troughs should be constructed, about 2ft. wide and 9in. high. These should be partly filled with scrap iron, so that the water from the mine could be utilised for cementation.

Tumby Bay Copper Mine (formerly known as the Wheal Bessie).—Situated in hundred of Hutchison. Mineral claims 8733 to 8737. There are strong indications that three lodes traverse the property, bearing E. and W., dipping S. about 30° off vertical. The workings have been confined to what is apparently the middle lode, where shallow pits and trenches have been sunk for a length of 600ft. The old workings have fallen in, but judging from amount of work done a great quantity of ore must have been obtained in the past. At the W. end two vertical shafts have been sunk 24ft. and 46ft. respectively. The most W. is the main shaft (6ft. by 4ft.) close timbered, with fixed ladder-way from surface to bottom. At the 46ft. level a crosscut has been driven N. for a total distance of 27ft. At 10ft. a well-defined formation of calcite and quartz 1ft. wide, of no value in the crosscut; 17ft. further in the main lode was intersected. It is from 2ft. to 3ft. wide of quartz and slate, with a seam of high-grade copper ore on the footwall from 4in. to 8in. thick. The formation here is well defined and is likely to continue down, and fully warrants further development. The drive E. on the course of the lode is in a total distance of 10ft. from the crosscut, and the drive W. is 9ft. In both the formation is from 2ft. to 3ft. wide, with a rich vein of ore 4in. to 6in. thick on the footwall, and the lode appears highly promising. The present drives along the course of the lode should be continued; also a winze should be sunk from one of the drives to test the lode. If this proved satisfactory the present main shaft, which is well situated, could be carried down to intersect the lode which, if the dip remains constant, should be met with at 100ft. below present level. Three samples for assay gave following results:—

No. 1. From east drive, 46ft. level, vein 4in., 21·4 per cent. copper.

No. 2. From west drive, 46ft. level, vein 6in., 26·1 per cent. copper.

No. 3. Ore dump, not dressed, 14 per cent. copper.

No information is available of work done in the past when mine was known as the Wheal Bessie.

Poona Copper Mine (*vide* Record of Mines, 1908, page 120).—The principal work carried on at present is confined to the 283ft. level, where driving E. is in progress on the N. lode and W. on the S. one. These lodes are about 80ft. apart, and the workings on each are connected by a crosscut driven S. from a point 12ft. E. of the main shaft. The drive E. on the N. lode is in a total distance of 168ft. from the shaft, and the formation for the last 40ft. is from 3ft. to 4ft. wide, densely impregnated with high-grade yellow ore which, if crushed and concentrated, should give good results. South lode—At 90ft. W. from the shaft a winze has been sunk on the lode to 70ft. below the 283ft. level. From the bottom of this winze a drive has been extended W. in the footwall portion of the lode for 39ft. This contains veins and small patches of sulphide ore which, taken in bulk, would be of low grade, but should yield a fair amount of concentrates. In the old W. workings on this lode and 80ft. above the present level a considerable amount of stoping was done in the early days, both above the level and underfoot, on what appears to be two shoots of ore 20ft. and 30ft. long respectively, with 36ft. of lower grade material left standing between the shoots. The W. one should, if it continue down, be intersected in the present drive when extended further W. The main working shaft is equipped with a winding winch, boiler, and poppet heads, with runners and ladders from surface to bottom of shaft, and everything for carrying on the work is in good order.

Paringa Mine (*vide* Record of Mines, 1908, pages 15 and 114).—The old plant has been dismantled and a new jigger, rockbreaker, &c., erected on a more convenient site. The necessary excavations and foundations for this purpose have been completed. The ore will be conveyed direct to the rockbreaker and thence by gravitation for further treatment. A number of ore bodies from 2ft. to 6ft. wide have been proved, and now that it has a well-equipped treatment plant the future prospect is highly encouraging.

The Graphite Mine.—Situated seven miles N.W. from Tumby Bay. A large graphite formation traverses the property bearing N.W., from 15ft. to 20ft. wide, and can be traced on the surface for a distance of five chains. The main shaft, sunk vertically in the formation, is 6ft. by 4ft. in the clear, and is down

25ft. At the bottom drives have been put in N.E. and S.W. for a distance of 15ft. each way, all in lode material consisting of schist and graphite, and neither foot nor hanging wall has yet been met. About three chains N.E. from the main workings No. 2 shaft has been sunk for 12ft. in the formation. To further prove and develop this promising lode the main shaft should be continued to at least 100ft. and a crosscut put in through the formation at that level, when it will possibly be found to be more compact and of higher value. Sample from main shaft gave 28·6 per cent. of graphite and from No. 2 shaft 17·0 per cent.

Limestone Flux Leases.—(Mineral Leases, 1552 to 1559, Campbell & Carver).—Situated in hundreds of Lincoln and Sleaford, along the shore of Port Lincoln proper, and about eight miles from township of Port Lincoln. A compact stratum from 2ft. to 5ft. thick of marine deposit is exposed along the coast for many miles and extends inland for a considerable distance. There appears to be good anchorage for fairly large ships within a short distance of land. A great quantity of marine limestone has been quarried and shipped away for flux.

Yelta Copper Mine (*vide* Record of Mines, page 155).—The principal work carried on at present is confined to the S. shaft, which is situated near the S.E. boundary, and about a half mile N.E. from the Moonta Mines, and the lode traversing the property appears to be the continuation of one of the Moonta lodes. Stoping operations are being carried on at the 15-fathom level. Two shafts have been sunk on the line of lode about 130ft. apart. These are partly vertical and partly on the underlay, and are connected at the 90ft. level. The main shaft, which is the most southern one, is down to a depth of 150ft. At the 90ft. level a drive N.E. on the hanging-wall for a distance of 130ft. connects with No. 2 shaft. For the first 60ft. the ore is of low grade, and it should be further tested by cross-cutting through the formation to the main footwall. At a point 60ft. from the shaft an improvement in the ore body is noticeable, and the Yelta Company had done a considerable amount of stoping over the drive. The present party of tributers met with a fine pocket of steel-grey and black ore, from which about 110 tons of over 30 per cent. ore have been removed. The stope at present is up a distance of 54ft. from the level, and the formation appears to be of great width, and consists of soft kaolinized and slate material with small veins of black ore and little carbonates varying in thickness from 1in. to 3in. At 68ft. from the plat a winze has been sunk to a depth of 12ft., when it holed through to the stopes which had been carried up from the 150ft. level. In the footwall of the winze a nice bunch of black ore was met, from which several tons of high-grade ore were obtained, making the total extracted for the past 10 weeks 126 tons of 20 to 40 per cent. copper. At 150ft. level driving on the course of the lode S.W. has been carried on for 33ft., the lode being 1ft. thick of ferruginous quartz with copper stains. The drive N.E. has been extended 21ft. At that point it deviates E. for a distance of 15ft., where a quartz lode 3ft. wide was met carrying a little copper. The drive N.E. was extended on the course of this lode for 60ft. At 20ft. from the point of intersection the lode appears to have improved in value. As a considerable amount of stoping has been done over the drive for a length of 30ft. and up to a height within 12ft. of No. 1 level, the top of the stope has been connected by a winze sunk from the latter. The lode in the stope at present is from 4in. to 12in. wide, with a vein of black ore in the centre 1in. to 2in. thick. Just under the stope and apparently on the same shoot of ore a winze has been sunk from the level to a depth of 48ft., and this at time of inspection was half full of water. At water level driving and stoping has been carried on in S.W. of the winze for 11ft., and the lode in the face is chiefly quartz impregnated with yellow ore, and is from 18in. to 20in. wide. At 36ft. from the plat a crosscut has been put in E. for 64ft., intersecting at 40ft. a lode formation 8ft. wide. It is of little value, but when further developed by driving along its course better results will be met with. Everything is in good condition for carrying on the work.

Oodlawirra—Ochre (Mineral Lease No. 2059).—The main working shaft on the property is down a total depth of 62ft. At the 58ft. level driving W. is in progress in the iron oxide deposit, containing high-grade ochre, in seams from 1ft. to 2ft 6in. wide. From the W. drive, driving has been carried in N. and S. in the

deposit for a distance of 12ft. each way, disclosing seams and bunches of good ochre all through the formation. It is evidently a large formation, but the exact width at any point cannot yet be determined, as hanging and foot walls have not so far been disclosed in any of the workings. The ochre occurs in regular seams and bunches through the whole deposit. All the material broken in the workings is hauled to the surface, where the best ochre is selected and bagged. A considerable quantity has been sent away for pigment, giving every satisfaction. The lower grade material has been stacked on the surface, and will be treated later on when a suitable plant for that purpose has been erected.

Walparuta Copper Mine (*Vide* Record of Mines, 1908, page 144).—Locality, 16 miles north of Mannahill Railway Station; area, 20 acres. Prospecting work to shallow depths has been carried on intermittently on the property for the last 15 years, and a number of separate quartz veins are disclosed in the open pits carrying copper and a little gold. The principal works are situated on the S.E. side of a range, 100ft. above the gully, and consist of open cuts and shallow pits sunk to depths of from 3ft. to 20ft., at various points along the outcrops. No. 1 hole is 4ft. deep, and is sunk in a gneiss formation 5ft. wide, which is, apparently, of no value, as a sample taken from all over the pit gave nil. No. 2 formation is exposed in an open working 20ft. deep and 12ft. long. The ore-bearing material consists of numerous quartz leaders, enclosed in hard mica schist, from 2ft. to 4ft. wide, containing copper ore, chiefly bornite and malachite. A sample taken from the S.W. end of workings gave 3·4 per cent. of copper and 2dwts. of gold, and one taken from the N.E. end gave 3·9 per cent. copper and 4dwts. of gold per ton. A considerable amount of work has been done a short distance S.E. of No. 2 workings, on what appears to be a third formation. In an open cut, 12ft. long by 10ft. wide, ore-bearing material is disclosed for the whole width, which consists of schist and quartz veins, with stains and seams of carbonates in the matrix. A sample taken from the vein gave 1·4 per cent. copper and trace of gold, and one taken from the surface dump gave 4·3 per cent. copper and 2dwts. of gold per ton. Mr. Cooper, the present holder of the claim, extracted from the above workings £150 worth of copper ore. The prospects of the formations traversing the block, and also other lodes in the locality, are highly encouraging, and, judging from present indications in the workings and the various outcrops, should probably contain, when further developed, shoots of fairly high value in gold.

Onkaparinga Dredging and Mining Company (Gold Lease 1450, formerly known as Stirling Reef).—Mr. W. H. Matthews, Chief Inspector of Mines, reports as follows:—"Since my previous visit to this property, the work of dredging and sluicing has been vigorously carried on, with results that should be considered fairly satisfactory, as operations had to be commenced on the outer edge of the alluvial deposit to prevent portions of the richer ground from being covered by waste or debris. The third cleaning up will probably take place during the ensuing month, and, from appearances, there should be an improvement in the gold contents per yard. Judging from the workings which are being extended into deeper, and what has proved to be richer ground, that improvement should continue as the work progresses. The face at present discloses a large body of gold-bearing drift or gravel, which can, after the next removal of the plant, be more economically worked and should give better returns. The work done and machinery erected up to the present are of a very satisfactory character, and show an honest endeavor to thoroughly explore and test the property. About 27,000 yards of material have been treated, yielding 80ozs. 4dwts. of gold, valued at £304 17s. 2d.

Carnotite—At the Radium Hill Mine, near Olary, work has been vigorously carried on, three shifts being employed on No. 2 shaft and surface work under the supervision of Mr. Johnson, the manager of the Radium Hill Company. No. 1 shaft is down 68ft. and is 6ft. 6in. x 3ft. 6in. The lode is stated to be very strong and well defined, and is fully 4ft. 6in. wide at bottom of the shaft, the carnotite being well distributed and the titanium ore giving every evidence of permanency. No. 2 shaft is 300ft. W. from No. 1 shaft, and is also 6ft. 6in. x 3ft. 6in. in the clear, and is down 71ft. A strong lode, rich in carnotite, is being worked here. Several costean pits also expose bodies of carnotite ore, and some fine lots of graded ore are at grass, showing rich incrustations of carnotite. A shipment of 30 tons of ore has

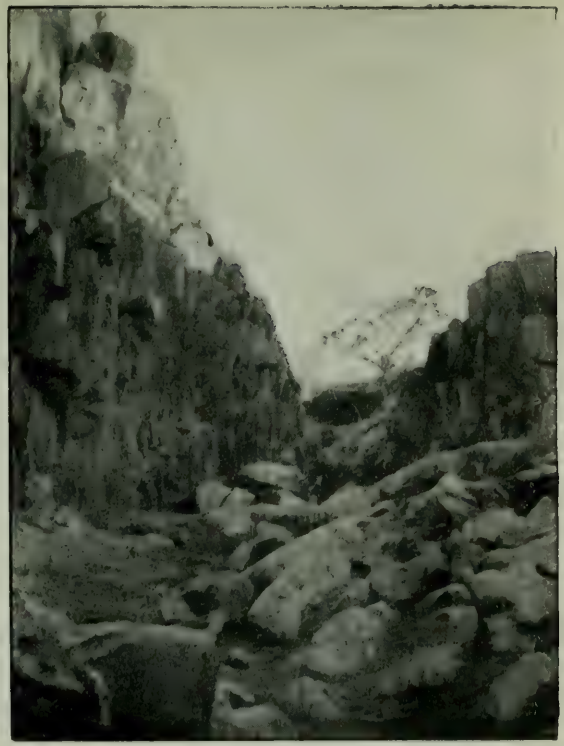
been forwarded to Europe to test in a practical manner the commercial values of the contained carnotite, vanadium, uranium, &c. The following analysis by Professor Wyndham R. Dunstan, M.A., F.R.S., Director of the Imperial Institute, London, will be of interest:—The sample, weighing 15lbs., consisted essentially of massive ilmenite, associated with biotite mica, and a small amount of a surface incrustation of canary-colored ochreous material resembling carnotite. The ilmenite contains as inclusions a considerable amount of mica. (*Vide* T.O. No. 850/1909.)

	Carnotite.	Ilmenite.		Carnotite.	Ilmenite.
Potash	5·2	—	Lanthanum and didymium oxide	—	2·13
Soda	1·8	—	Yttrium oxide	—	1·16
Lime	1·0	0·25	Chromium sesquioxide	—	1·60
Magnesia	trace	trace	Uranoso-uranic oxide	47·8	2·25
Lead oxide	1·3	0·40	Vanadic oxide	16·8	0·93
Ferric oxide	19·4	17·87	Titanium dioxide	—	51·85
Ferrous oxide	—	17·37	Silica	—	1·15
Manganous oxide	—	0·24	Phosphoric oxide	trace	—
Alumina	5·7	—	Water	—	1·21
Thorium oxide	Nil	0·13			
Cerium oxide	—	1·26			
				99·0	99·79

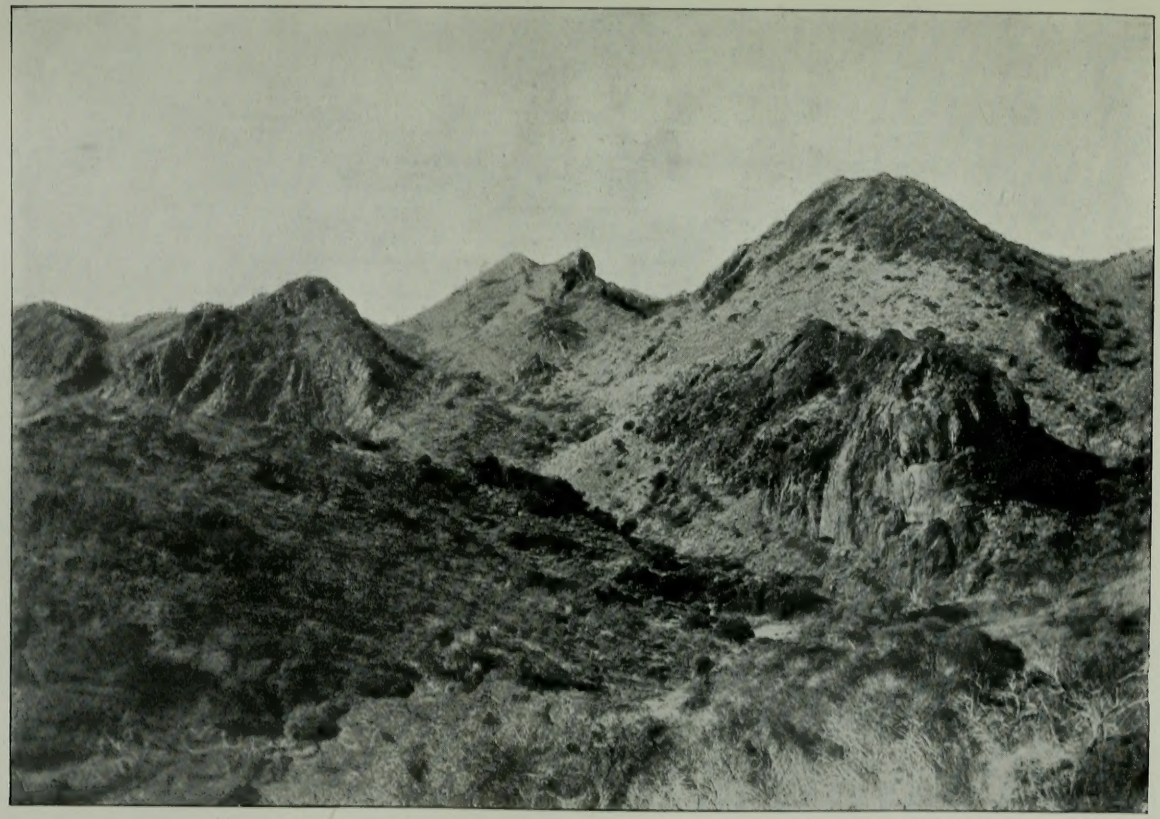
Producer Gas for Crushing Quartz—The Government Geologist reports having inspected a producer gas engine at the old Alma Extended Battery at Waukaringa, where it was engaged crushing quartz from the Ajax Mine. The engine is of 35 h.p., and drives 10 head of heavy stamps. The fuel consumed consists of charcoal, which is made in the district. Mr. Rees Rees, one of the proprietors, informed him that three bags of charcoal, costing 1s. 6d. each, were used per day of 10 hours and 13 tons of ore crushed in that time, and estimated the cost of crushing at 2s. 6d. per ton. He, the Government Geologist, points out the great advantage that might follow the use of producer gas engines instead of steam at the Government batteries, owing to the reduced cost that could be charged to the owners of mines, who would be enabled to supply larger quantities of stone of low grade to be treated. (D.M. 1175/09).

Tanami Goldfield—All geological examinations and reports on the Northern Territory being performed by the South Australian staff, it is fitting that these should be recorded in this review. Conflicting reports have in the past been received from prospectors who have visited the Tanami area, as to the likelihood of payable gold being found. That authoritative information might be given it was decided that the Government Geologist should examine the country, and accordingly he left Adelaide on March 8th for Port Darwin, travelling thence to Victoria River Downs Station with horses. Here camels were available for the remainder of the journey by way of Gordon Downs and Sturt Creek Station to Tanami, which is situated in lat. 19° 58′ 47″ S. and long. (approx.) 129° 45′ E. The result of his examination was distinctly in favor of the likelihood of the reefs in the locality proving payable at depth. The prospects were sufficiently good to warrant every encouragement by the Government in well-sinking and opening up routes to the field. A rich find of gold was discovered whilst the party was on the return journey, and, in view of a probable rush to the field, it was deemed expedient to appoint a resident warden and station police on the field, and accordingly Mr. L. C. E. Gee left Adelaide in October last to take charge. So far the country has been unfortunate in the matter of rain, and developmental work has been much hindered by the insufficient water supply on the ground. A recent report states that water has been obtained by boring 17 miles from Tanami, and as Mr. T. Pearce, who is in charge of the Government well-sinking party, reports that he has located several good wells on the route between Mucka and Tanami, access to the field will be rendered much easier and safer than in the past. The Government Geologist's report on this locality is now available in pamphlet form, and can be obtained on application to the Mines Department.

VIEW IN TANAMI GORGE.



TANAMI ROCKHOLES.



HILLS NEAR YUDNAMUTANA.